# Railroad Preemption Issues



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# Issues

- Annual Inspections
- Blankout signs
- Signs W25-1, W25-2, and Yellow Traps
- Queue Detectors
- Simultaneous vs. Advance Preempt
- Advance Heads
- Commuter Rail (TTA, CATS)
- A Case Study:  Thomasville
- Division Issues????

# Annual Inspections

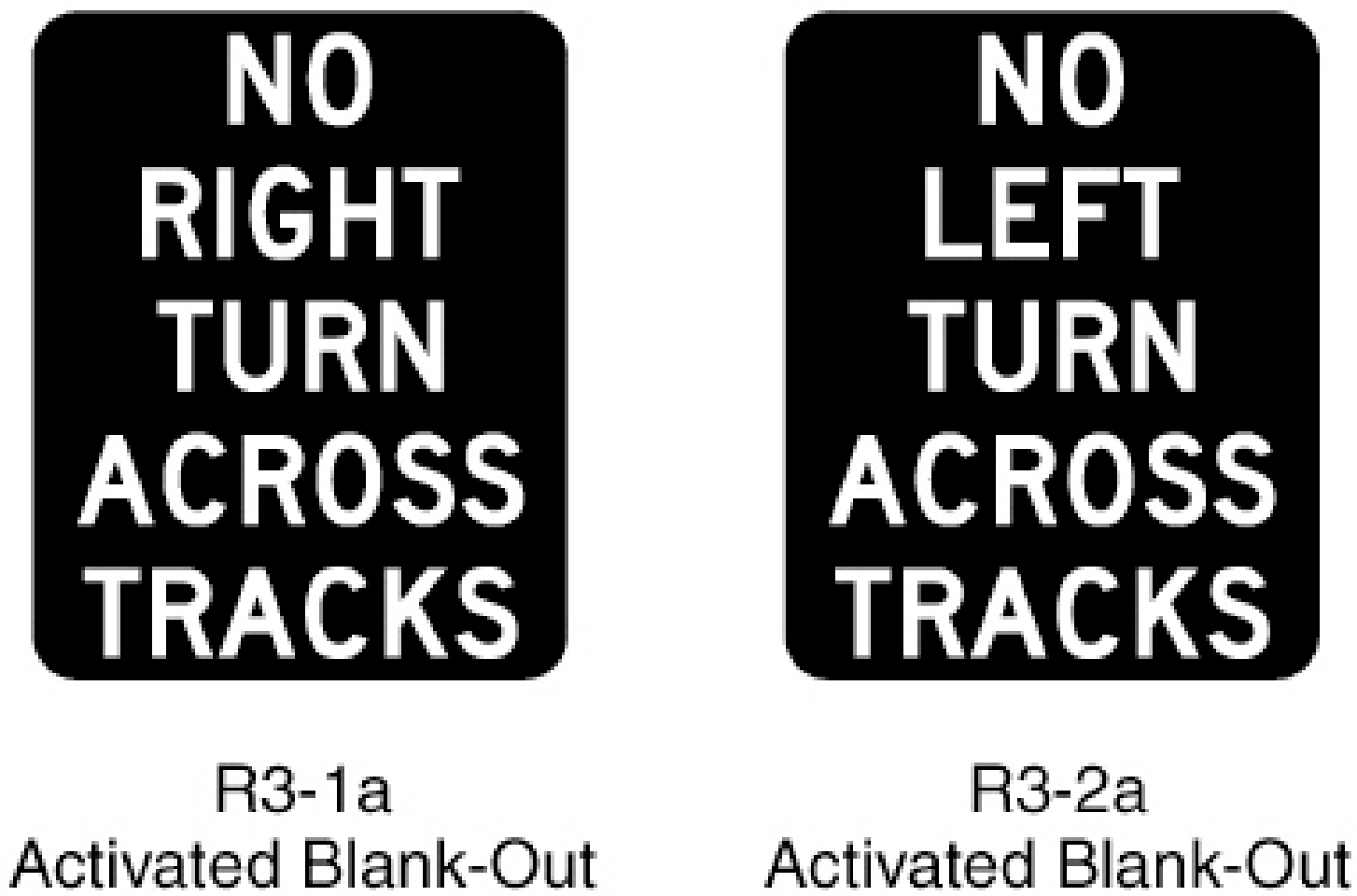
- Should be done at regular intervals every 12 months
- Helps maintain contact between Division and Railroad - Promotes Safety
- Send copy of Inspection forms to Richard Mullinax in Raleigh

# Blankout Signs



Existing signs used in NC

# Blankout Signs




Signs in *MUTCD*; May be used in NC

# Blankout Signs

- Blankout signs (R3-1a and R3-2a) now mentioned in *MUTCD*; Previously were not covered
- Do not use "DO NOT ENTER" blankout sign
- Do not use with RED ARROWs or Yield signs.
- NC may experiment with use of new sign verbage in *MUTCD*

# Blankout Signs

- Original signs were Vericom (Fold out) or Internally Illuminated signs - These should be replaced
- Current standard for new signs is LED
- Fiber Optic signs recently installed are OK for remainder of their useful service life

# New Yellow Trap Signs


W25-1


W25-2

# New Yellow Trap Signs (W25-1: "Opposing Traffic Has Extended Green")

- Alerts motorist to presence of a full-time yellow trap condition
- Required standard in Section 2C.39 of *MUTCD*
- Will be used where yellow traps exist and will be retained (limited situations)
- Low speed locations (< 25 MPH)
- Crash history will be reviewed

# New Yellow Trap Signs (W25-2: "Opposing Traffic May Have Extended Green")

- If signal is permissive or protected/ permissive, potential exists for yellow trap when entering preempt
- NC does not design to prevent yellow traps when entering Railroad Preemption (Timing limitation)
- Required standard in Section 2C.39 of *MUTCD;* will be standard on RR preempt designs as needed
- Used to alert motorist that potential for yellow trap condition exists some of the time (when entering RR Preempt)

# Queue Detectors

- Used as an alternative to clear tracks if vehicular traffic routinely queues in throat and onto tracks
- Used where tracks are beyond 200’ from intersection and preempt clearance time exceeds capacity of railroad circuitry
- Not connected to Railroad circuitry
- NOT to be used in place of Preemption

# Simultaneous Preemption

- Railroad warning equipment (Flashers and gates) activate at the same time signal enters preempt phasing
- Generally used when warning time is 30 seconds or less
- Ideally, all railroad preemptions would utilize simultaneous preemption

# Advance Preemption

- Traffic signals enter preempt mode and phasing before railroad warning equipment (Flashers and gates) activate
- Generally used when warning time is more than 30 seconds
- Possible to be out of Track Clearance phase (green) before gates secure crossing
- May consider use of advance heads if there is significant offset between beginning of preemption sequence and activation of railroad warning equipment

# Advance Heads

- Generally not used at crossings with gates
- Advance heads are not to be used in place of railroad warning devices to protect crossing
- May be used more frequently with at locations with advance preemption that have a long throat to clear
- May be incorporated into normal phasing through use of Timed Overlap

# Advance Heads

- When advance heads are used, generally consider restricting visibility of far heads to eliminate “bleed through” effect
- Optically Programmed Heads vs. Louvers
- Programmable louvers have been successfully tested and used in Divisions 5 and 12

# Optically Programmable Heads



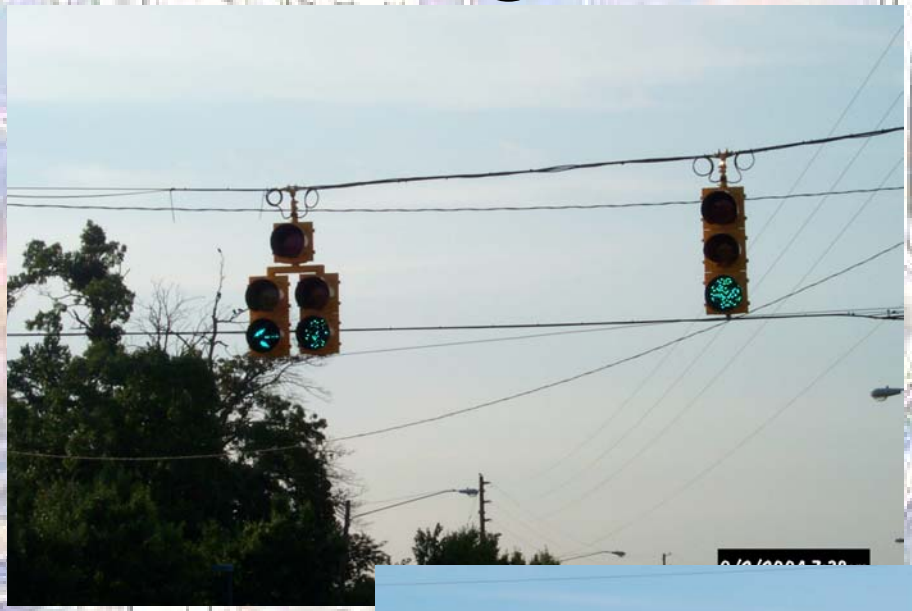

# Louvers

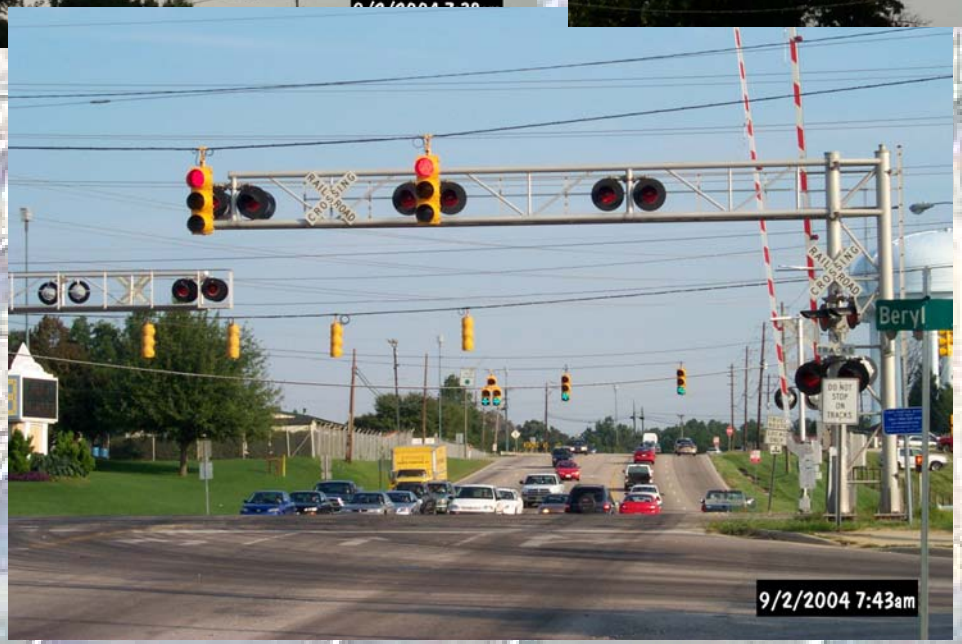

9/2/2004 7:51am


ONLY
ONLY
WEST GERMAN GARAGE
9/2/2004 7:50am


ONLY
9/2/2004 7:50am

# Programmable Louvers



# Commuter Rail Topics
(TTA, CATS)

- Frequent train crossings disrupt coordination
- Stations near crossing causing premature activation
- Motorist education to improve awareness
- Working with Signing and Traffic Control sections to develop new signs and markings to increase visibility to drivers

# A Case Study: Thomasville - The Issues

- "The Big Chair" - Randolph St. (NC 109)
- Signalized intersections on both sides of tracks (operate from same controller)
- Downtown urban setting (2 lanes, 20 MPH) with on street parking, pedestrians, heavy truck traffic, and multiple driveways
- NS mainline with ~50 trains/day and top speed of 79 MPH protected by 4 quadrant gate system

# A Case Study: Thomasville - The Issues

- Existing pre-timed 4 phase signal with no Timed overlaps; constant queuing on tracks
- Existing yellow traps on NC 109
- Upgrade to 2070 equipment as part of Senate Bill CLS project
- Adjacent intersection with lighter traffic volumes but similar geometrics had just been upgraded

# A Case Study: Thomasville - The Issues

Downtown Thomasville at the Big Chair

# A Case Study: Thomasville - The Goal

- Upgrade and modify signal to increase safety but maintain efficiency
- Remove Yellow Traps
- Add Timed Overlaps to reduce (eliminate) traffic queuing on tracks
- Establish new phasing that clears tracks within limits of existing track circuitry (could not increase clearance time)

# A Case Study: Thomasville - What Happened

- Implemented “Max Safety” Design that added Timed Overlaps and removed Yellow Traps
- Similar to changes at Fisher Ferry Street
- Cycle length increased from 85 to 180 seconds
- Delays doubled; during peak hours, often tripled or quadrupled
- “Gridlock” - People seeking alternate routes
- It was a Public Relations nightmare for the Division

# A Case Study: Thomasville - The Changes

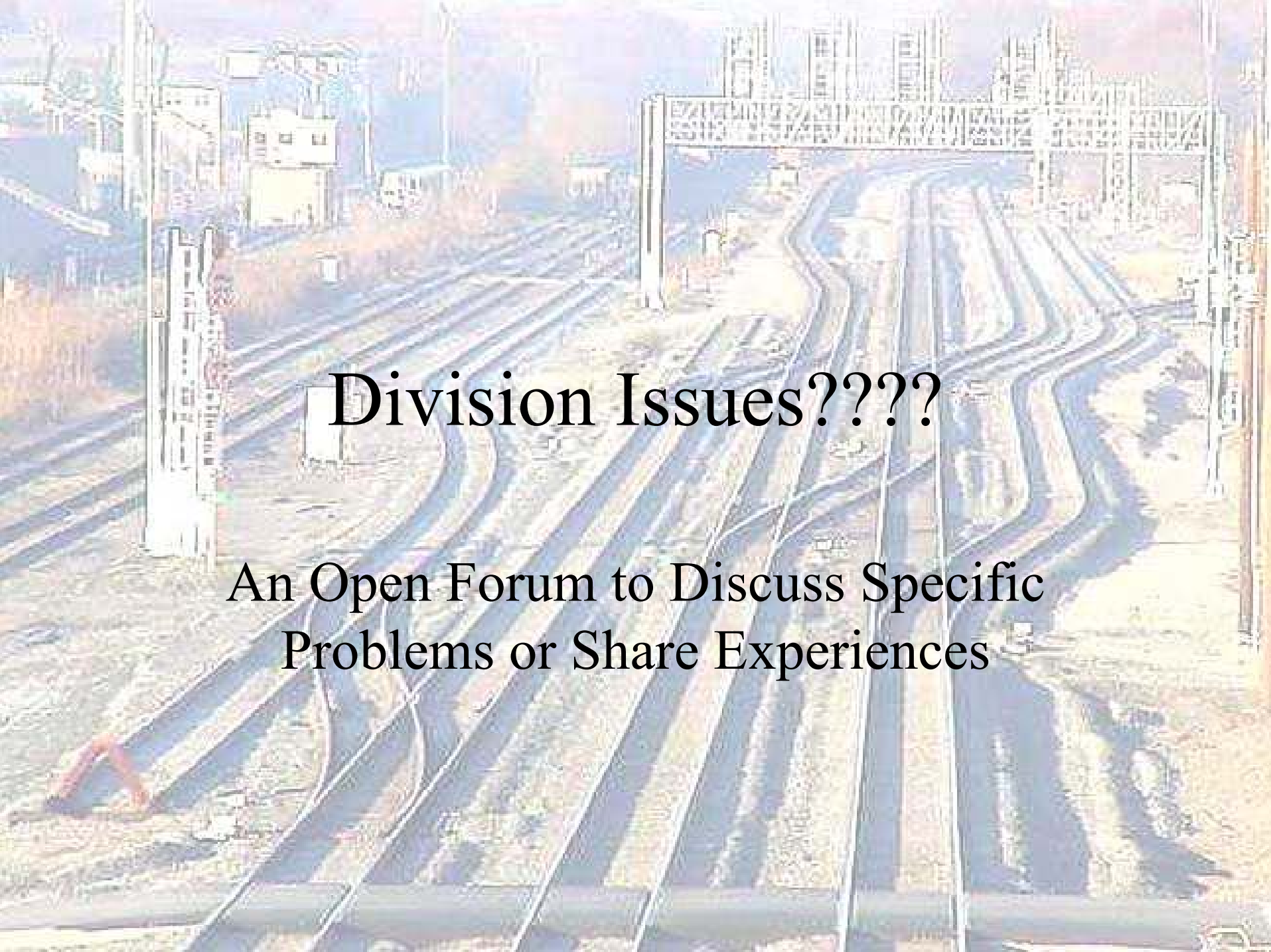
- A compromise that added Timed Overlaps to clear tracks but kept Yellow Traps
- Accident analysis performed to study recent crashes due to Yellow Trap
- Cycle Length ~ 120 seconds
- Dynamic max times added to Randolph Street to help flush traffic after exiting preempt and during heavy queuing

# A Case Study: Thomasville - The Result

- Queuing across tracks minimized
- Yellow trap still exists (sign W25-1 added) but no increase in accident rate
- Traffic is flowing smoothly once again
- No significant complaints from public

# A Case Study: Thomasville - Lessons Learned

- Compromise safety with efficiency - “Max Safety” is not always best solution
- Yellow traps not preferred, but may be acceptable at low speeds
- Increasing phasing and cycle length does not help move cars
- “If it ain’t broke, don’t fix it”



# Division Issues????

An Open Forum to Discuss Specific Problems or Share Experiences

# Questions??

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